

IN THE CLAIMS

1. (currently amended) A ~~communications~~ communication apparatus using an adaptive antenna having ~~in a high frequency unit~~ an antenna unit including a plurality of antenna elements and a plurality of adjustment units provided corresponding to the plurality of antenna elements for adjusting directivity of ~~an entire~~ the adaptive antenna, comprising:

an interference wave element extraction unit extracting an interference wave element other than a ~~requested~~ desired signal to be received by said ~~communications~~ communication apparatus from a received signal by the antenna unit when ~~adjustment values of the plurality of adjustment units are perturbed in a perturbation~~ adjustment values of the plurality of adjustment units are perturbed in a perturbation within one symbol time used in said ~~communications~~ communication apparatus; and

an adaptive control unit performing adaptive control on the plurality of adjustment values such that the extracted interference wave element can be ~~minimized~~ reduced.

2. (previously presented) The apparatus according to claim 1, wherein:

the plurality of antenna elements comprise a feed antenna element and one or more no-feed antenna elements near the feed antenna element;

the adjustment units are variable reactance circuit units connected to each no-feed antenna element; and

the adjustment values are variable reactance values.

3. (previously presented) The apparatus according to claim 1, wherein:

the adjustment units are weight units corresponding to each of the plurality of antenna elements;

the antenna unit further comprises a composing circuit unit for composing a weighted signal from each antenna element; and

the adjustment values are weight values of the weight units.

4. **(currently amended)** The apparatus according to claim 1, wherein said ~~communications~~ communication apparatus converts a transmission data sequence into a parallel data sequence, and each of the converted data sequences is transmitted in parallel by a plurality of carriers having different frequencies; and said interference wave element extraction unit extracts as the interference wave element a virtual subcarrier element as a carrier not used in data communications in a plurality of carriers.

5. (original) The apparatus according to claim 1, wherein said interference wave element extraction unit extracts an interference wave element using a result of a Fourier transform of a digitized signal of the received signal.

6. (original) The apparatus according to claim 1, wherein said interference wave element extraction unit extracts an interference wave element using a result of a Wavelet transform of a digitized signal of the received signal.

7. (previously presented) The apparatus according to claim 1, wherein said interference wave element extraction unit extracts an interference wave element using received data obtained when the adjustment values are perturbed in one of two symbols and received data obtained when the adjustment values are not perturbed in the other symbol.

8. (previously presented) The apparatus according to claim 7, wherein said interference wave element extraction unit uses received data obtained by repeatedly

perturbing each adjustment value of the plurality of adjustment units for each sample in said one symbol.

9. (previously presented) The apparatus according to claim 7, wherein said interference wave element extraction unit uses received data obtained by sequentially and continuously perturbing each adjustment value of the plurality of adjustment units for a plurality of samples in said one symbol.

10. (previously presented) The apparatus according to claim 1, wherein said interference wave element extraction unit extracts an interference wave element from the received signal obtained in a format in which a section of perturbing the adjustment values of the adjustment units in the one symbol and a section of not perturbing any adjustment value of the plurality of adjustment units are included.

11. **(currently amended)** The apparatus according to claim 1, wherein said ~~communications~~ communication apparatus comprises the antenna unit, the interference wave element extraction unit, and the adaptive control unit; the antenna unit comprises a plurality of diversity branches provided in spatially different positions; and said ~~communications~~ communication apparatus further comprises a weight composite unit for weight composing a signal from each diversity branch.

12. (original) The apparatus according to claim 11, wherein the adaptive control unit is in each of the plurality of diversity branches, and independently performs control of each adjustment value.

13. (original) The apparatus according to claim 11, further comprising a cooperative control unit performing cooperative control of each adaptive control unit for each adaptive control unit in the plurality of diversity branches.

14. (previously presented) The apparatus according to claim 1, further comprising an adjustment value setting unit setting to a predetermined value one of the adjustment values of one of the adjustment units other than a part of the adjustment units so that an influence of adjustment by the part of the adjustment units can be evaluated in the plurality of adjustment units.

15. (previously presented) The apparatus according to claim 1, wherein said adaptive control unit performs control of the adjustment values in a steepest gradient method.

16. **(currently amended)** A ~~communications~~communication apparatus using an adaptive antenna having ~~in a high frequency unit~~ an antenna unit including a plurality of antenna elements and a plurality of adjustment units provided corresponding to the plurality of antenna elements for adjusting directivity of ~~an entire~~the adaptive antenna, comprising:

interference wave element extraction means for extracting an interference wave element other than a ~~requested~~desired signal to be received by said ~~communications~~communication apparatus from a received signal by the antenna unit when ~~adjustment values of the plurality of adjustment units are perturbed in a~~plurality of adjustment values within one symbol time used in said ~~communications~~communication apparatus; and

adaptive control means for performing adaptive control on the plurality of adjustment values such that the extracted interference wave element can be ~~minimized~~reduced.

17. **(new)** A communication apparatus using an adaptive antenna having an antenna unit including a plurality of antenna elements, comprising:
- a plurality of adjustment units provided corresponding to the plurality of antenna elements for adjusting directivity of the adaptive antenna;
 - a control unit controlling the plurality of adjustment units to perturb respective adjustment values in a manner in which a plurality of the respective adjustment values are perturbed within one symbol time used in the communication apparatus;
 - an interference wave element extraction unit extracting an interference wave element other than a desired signal to be received by the communication apparatus from a received signal by the antenna unit when the plurality of the respective adjustment values are perturbed within the one symbol time; and
 - an adaptive control unit performing adaptive control on the respective adjustment values such that the extracted interference wave element can be reduced.